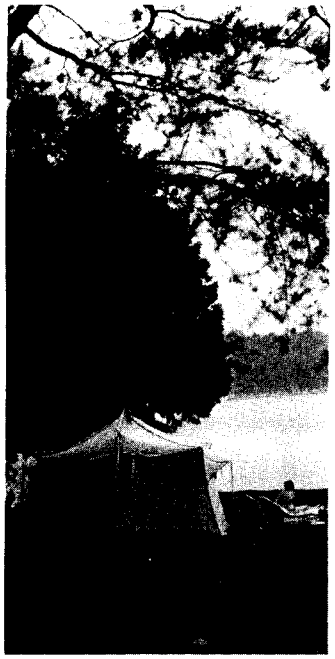
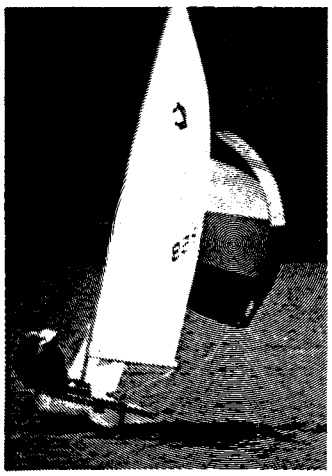
US Army Corps of Engineers
Waterways Experiment Station





ENVIRONMENTAL LABORATORY

RECNOTES
NATURAL RESOURCES RESEARCH PROGRAM

VOL R-89-2 INFORMATION EXCHANGE BULLETIN MAY 1989

Sign used to mark zoning boundaries

Locating and Identifying Shoreline Allocation Zoning Boundaries

Mike Magley
Mobile District

On December 13, 1974, a Department of the Army regulation was implemented concerning lakeshore management at Civil Works projects. This regulation brought uniformity to lakeshore management programs nationwide by providing "policy and guidance on the protection of desirable environmental characteristics of Civil Works lake projects and restoration of shorelines where degradation has occurred through private exclusive use." The regulation required that Lakeshore Management Plans (LMPs) be prepared on projects where private exclusive usage had occurred. Among other requirements, the establishment of shoreline allocation zoning was necessary.

Zoning classifications were designed to aid in the protection and orderly management of project resources. Four types of zoning categories were developed: public recreation, prohibited access, protected shoreline, and limited development areas.

Public recreation areas were set aside for intensive recreational development

or use. These areas include campgrounds; day-use parks; primitive or natural areas; lands leased to public groups or other local, state or federal agencies for recreational use or development; and marine services.

Prohibited access areas designated sites where public access was restricted for safety or other reasons. These may include, for example, the dam, the powerhouse intake area, and the government's boat basin.

Protected shoreline areas were established to protect endangered species and important habitat for fish and wildlife, preserve the scenic appeal of the area, protect important cultural resources, and keep navigation channels free from obstructions.

Limited development areas are the only areas which allow certain specific private uses such as placement of private docks. These facilities/uses are managed under a permit system.

Establishing Original Allocation Zones at Lake Lanier

In response to the regulation, project personnel at Lake Sidney Lanier began an extensive review of the shoreline to determine appropriate zoning of public lands. The effects of zoning on adjacent landowners and the level of development in navigation channels were minimized and the benefits to wildlife and aesthetics were maximized. Unfortunately, land bordering the lake had been well developed and the relatively thin border of fee owned lands around the lake made minimizing the effects of zoning on adjacent landowners difficult.

Allocation zones were plotted on US Geological Survey (USGS) contour maps using a color-coding scheme. The proposed zoning was publicly reviewed, revisions made, and the LMP finalized. Nearly 600 protected areas were established around the lake; recreation areas plus an additional 38 lease areas (classified as recreation) were established in the project master plan and incorporated into the LMP; and 2 prohibited access areas were established (in the area of the dam and the government's boat basin). The rest of the shoreline was classified as limited development.

The allocation zoning maps have proved very useful in managing private exclusive uses on the lake. However, as development pressures increased, some of the shortfalls of the original mapping system became clear. How do the public and project staffs know exactly where these zoning boundaries are located on the ground?

When meeting with applicants for Lakeshore Use Permits to determine the feasibility and locations of proposed facilities, staff members approached this question in differing ways. Some relied on their comparison of geographic features with the allocation maps. Others scaled off the distance on the allocation maps from a known government boundary corner along the *public property* line as represented on those maps, to a point where the zoning designation changed. Thereafter, they estimated a direction of travel from that point, continuing along the *zoning* boundary line, to its intersection with the shoreline. Subsequently, that information was used in the field to find the same points on the ground. Still others took the map scaling approach, but, for example, began at a boundary corner at the opposite end of the same property line that the last ranger had used, measured the distance in the field, and ended up at different points along the property line and at the shoreline than the last ranger had. Unfortunately, the existing system simply was not precise enough and resulted in errors and a lack of consistency in evaluating permit requests.

Redefining Lake Lanier's Allocation Zones

These problems illustrated the need to change the method of defining allocation zone boundaries. First, all allocation zone boundaries were plotted on project boundary line maps. Specific boundary line corners were identified on the original (USGS) allocation maps. (These are fixed points which can be readily identified in the field as numbered monuments or angle irons.) Then compass bearings were taken on the original allocation maps from those points to the appropriate zoning boundary at the shoreline. This information was then transferred to a project boundary line map for use in the field.

Once maps were completed, a three-person crew identified boundary line corners and sighted the given bearings to the shoreline. Shoreline boundary locations which did not appear consistent with the intent of the original mapping (1975) were often adjusted in the field using new compass bearings established at the site. Detailed records were maintained on any permitted facilities found to be within areas zoned other than limited development.

Zoning boundaries were marked at the shoreline with a diamond-shaped sign mounted on a steel signpost. Signposts were placed at the elevation of the normal summer pool with the sign mounted

5 feet above water level. A standardized color scheme was used to represent different allocation zones (Figure 1).

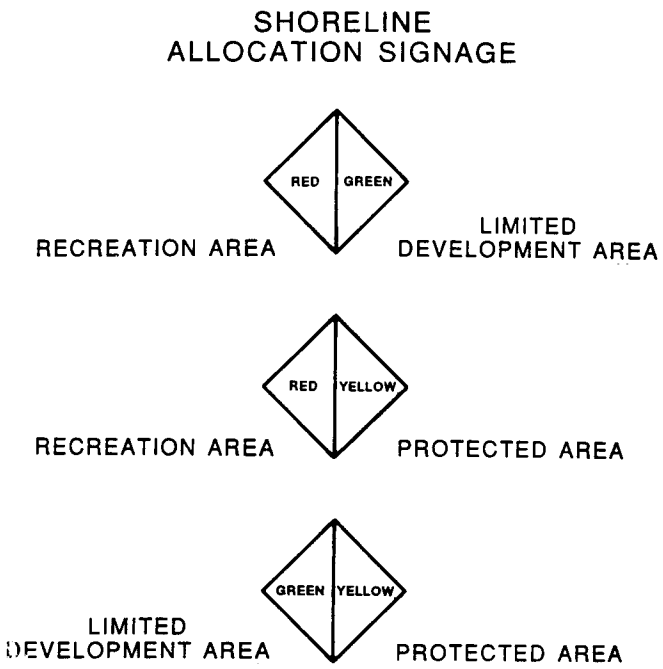


Figure 1. Color scheme for signs

As expected, there were some locations where facilities had been erroneously placed in areas other than limited development. Additionally, the original allocation maps delineated boundaries of some recreation areas which were inconsistent with the project master plan or lease agreements. Each allocation boundary site received an in-the-field administrative review. Mitigation to clear a few floating facilities was required, resulting in relocation of signs and establishment of new compass bearings. Again, detailed records were made explaining any changes which had occurred.

Finally, all field notes were incorporated into the new zoning maps to produce a final working copy for each allocation zone boundary (Figure 2). Zoning boundary location information was recorded on a photocopy of the appropriate section of project boundary line map and stored in protective polyurethane sheeting in a binder. This binder copy serves then as the master copy from which any person can determine a correct allocation zone boundary beginning at the same point on the government line as any other person. Hence, uniformity in approach has been established and accuracy is better assured. With signs in place, both staff and the public can readily identify zoning boundaries.

Materials Used

Initially, a field copy allocation map was produced by taking compass bearings from the original allocation (USGS) maps. These field copy maps were produced using a Silva azimuth compass, type 15T; a magnifying glass; and an engineering rule on a nonmetallic table surface positioned at least 4 feet from any wall containing electrical wiring to minimize magnetic interference.

Once in the field, shoreline locations were identified using a Suunto azimuth compass, type KB-14/360, and a surveyor's range pole. A brightly colored vest was often worn by crew members to increase visibility when sighting to the shoreline.

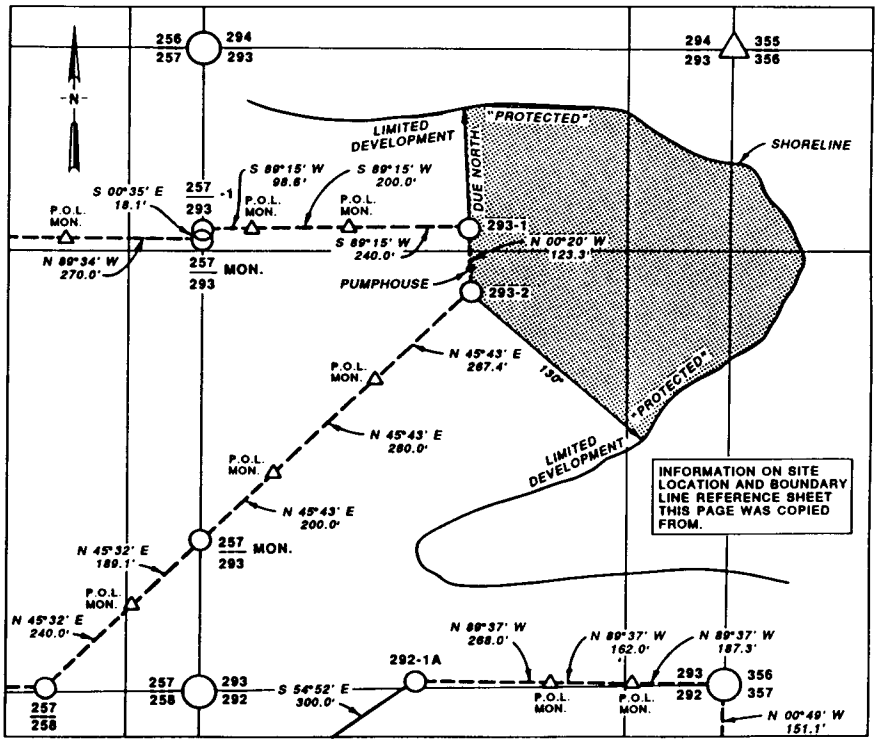


Figure 2. Final working copy for zone allocation maps

End Result

The signs that have been placed at Lake Lanier are proving to be very helpful in determining zoning boundaries at the shoreline. However, the sighting of a sign is not the only step in determining the boundary location when considering a proposed Lakeshore Use Permit. It is recognized that some signs may be vandalized, altered, or moved to make room for "just one more dock." When evaluating requests for facilities adjoining these boundaries, sign locations must be verified.

Plans are to transfer the information contained on the new allocation maps to a USGS map for production of a large public display at the Resource Manager's Office. A booklet which explains the allocation zoning at Lake Lanier and contains maps of that zoning will also be produced and may be purchased by any interested party.

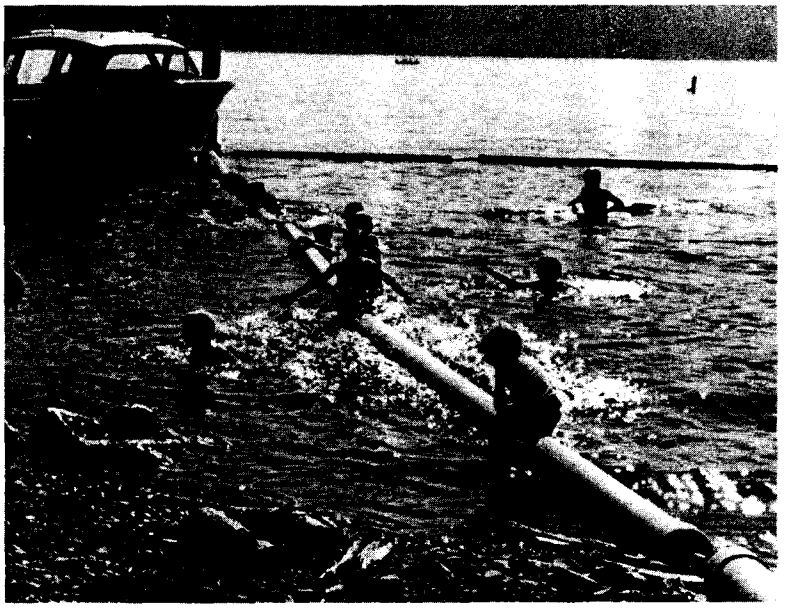
The redevelopment of Lake Lanier's shoreline allocation maps has been a long involved process spanning over one year from start to near completion. A concise mapping system of allocation boundary zones is essential to ensure that all who use these maps do so in a consistent, uniform manner. As development pressures increase in areas surrounding Corps-managed lakes, zoning maps which leave too much room for interpretation can make lakeshore management more difficult than necessary. Beat the rush! Look at your maps now and take steps to ensure that they will meet your future needs.

The Ultimate Swim Line

Cindy Samples
Libby-Albeni Falls
Priest River, Idaho

The use of polyvinyl chloride (PVC) swim lines is proving to be an effective tool in reducing the maintenance cost of swim lines to Albeni Falls Dam. The initial cost is higher, but is offset by the low maintenance required once installed.

Recreation areas have used PVC swim lines for a decade, but maintenance problems continued to occur because the cable connections continued to break. At Albeni Falls, Supervisory Park Ranger Dave Lescalleet and the resource maintenance crew devised a system for attaching the sections



Swimmers at play on and near the swim line

of pipe together without using cable. The modification allows the swim lines to twist, spin, and float, but remain in their proper location.

To ensure that the swivel system would work, the swim line was installed at a test site. The chosen recreation area would subject the swim line to extreme conditions. The area is subjected to 6-foot waves and large quantities of drift and is a popular swim area. The swim line withstood the elements. Best of all there was no maintenance required during the first season of use. Continued visitor assistance was necessary to ensure boaters secure boats in proper mooring locations and not to swim lines or pilings.

The swim line proved a success. Each swim area at Albeni Falls will be delineated with the PVC swim lines this spring. At last, a swim line has been found that requires minimal maintenance and clearly marks the designated swim area.

Hardware required for the swim line consists of:

- 6-inch PVC Schedule 40 20-foot section
- 6-inch PVC Schedule 40 caps
- 5-7/8 inch diameter polystyrene logs, 4-foot lengths
- 1/2 inch eyebolts - 3 inches long - 2-inch minimum thread
- 1/2 inch NC nuts
- 1/2 inch lock washers
- 3/8 inch swivels
- 3/8 inch quick links
- 18-inch crushproof hose, 2-1/2 inch diameter
- 1/8 inch stainless steel, 4-inch-diameter concaved washer, 9/16 inch hole in center

Note: All metal hardware must be rustproof.

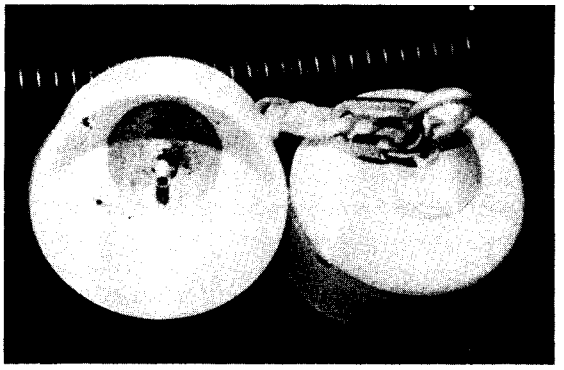
The stainless steel washers were designed and constructed by Albeni Falls Dam powerhouse employees. There are two 4-inch-diameter washers per cap, one inside and one outside, pressed into a concave shape to precisely fit the contour of the cap. The large size and precise fit of the washers provide additional strength to prevent breakage from the constant motion of the pipe and hardware.

The crushproof hose is used as a safety measure. There was concern that with all the moving hardware, a threat might be posed to swimmers' fingers and toes. The crushproof hose is tight fitting between pipe sections and encloses all hardware, alleviating this concern.

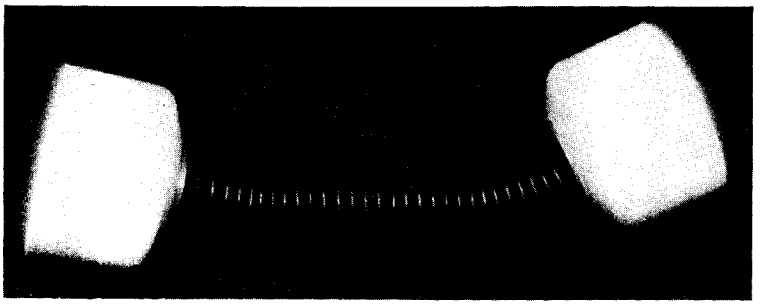
The eyebolts are welded shut to ensure that the quick links cannot slip out.

The polystyrene logs are considerably cheaper than filling the pipe with Styrofoam. Park Ranger Al Lookofsky at Lake Shelbyville, St. Louis District, provided information for the only known source of the polystyrene logs: Amotex Plastics Division, 434 Houston Street, Nashville, TN 37212. Amotex Plastics can be reached at (615) 254-1381.

For more information about the swim line, contact Cindy Samples or Dave Lescalleet, US Army Corps of Engineers, Albeni Falls Dam, PO Box 310, Newport, WA 99156 or call (208) 437-3133.



Swivels and quick link hooked together; crushproof hose goes on before the final connection



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PO Box 631
Vicksburg, MS 39181-0631

Articles may be as short as 200 words to as long as 1,500 words. Articles will be edited and returned to you for your approval prior to publication. Whenever possible, please submit black-and-white or color photographs or slides showing the subject of your article. Provide descriptive captions for your photographs.

NATURAL RESOURCES RESEARCH PROGRAM

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